network controller (hereinafter, referred to as a CRNC) which controls a shared channel of a radio network are located on different radio networks, comprising the functions of: a) generating a radio link control—protocol data unit (hereinafter, referred to as a RLC-PDU) in a radio link control (hereinafter, referred to as a RLC) layer of the SRNC, and generating a protocol data unit having RLC-PDU information needed for supporting the hybrid ARQ type II/III based on a header of the RLC-PDU (hereinafter, referred to as a HARQ-RLC-Control-PDU); b) transmitting the RLC-PDU and the HARQ-RLC-Control-PDU to a medium access control dedicated (hereinafter, referred to as a MAC-D), which treats a general user part of a MAC layer through a logical channel; c) transmitting the RLC-PDU and the HARQ-RLC-Control-PDU from the MAC-D of the SRNC to a medium access control common/shared (hereinafter, referred to as a MAC-C/SH), which treats common/shared channel part on the MAC layer of the CRNC; d) transforming the RLC-PDU and the HARQ-RLC-Control-PDU of the MAC-C/SH of the CRNC to a transmission block and transmitting it to a physical layer of a base station through a transport channel; and e) processing the transmission block to a radio transmission form in the physical layer of the base station and transmitting it from the base station through the physical layer.

[0041] Also, the present invention further comprising the function of: f) storing the RLC-PDU to a buffer, extracting the RLC-PDU stored in the buffer by using the HARQ-RLC-Control-PDU, decoding the extracted RLC-PDU and transmitting the RLC-PDU to an upper layer, then transmitting a response on the radio network.

[0042] The present invention is a method for realizing the hybrid ARQ type II/III on the downlink of an asynchronous mobile communication system which includes the CRNC and the SRNC, and may be adapted in a technical field where packet data service is used.

[0043] In an asynchronous communication system which has the CRNC and the SRNC on a different asynchronous network, the present invention which uses the hybrid ARQ type II/III may increase system efficiency by combining a changeable coding rate, a pre-transmitted data and a re-transmitted data and can provide satisfying service quality.

[0044] To perform the combining on the hybrid ARQ type II/III, the receiver should have information concerning the current receiving RLC-PDU, and the information composing part of the RLC-PDU should be transmitted more stably than a transmitted data.

[0045] For the above, the present invention generates the HARQ-RLC-Control-PDU, referring to the RLC-PDU, wherein the HARQ-RLC-Control-PDU has information of the RLC-PDU which is used for supporting the hybrid ARQ type II/III. At this time, the HARQ-RLC-Control-PDU includes sequence number of the RLC-PDU and a version number.

[0046] The RLC-PDU and the HARQ-RLC-Control-PDU are transmitted from a RLC protocol entity to a MAC-D protocol entity by using one or more logical channels and transmitted from the MAC protocol entity to the physical layer by using one or two transport channel of same type. Also, The RLC-PDU and the HARQ-RLC-Control-PDU are transmitted from a transmitting part to a receiver by using one or two physical channels of the same type.

[0047] According to the present invention, a HARQ-RLC-Control-PDU encoding process with low coding rate can reduce errors in packets, which may include the RLC-PDU information. Also the RLC-PDU information has no need to be known in advance for combining because the receiver first stores the received RLC-PDU in a buffer and determines the data processing method for the stored data after checking the HARQ-RLC-Control-PDU.

BRIEF DESCRIPTION OF THE DRAWING

[0048] Other objects and aspects of the invention will become apparent from the following description of the embodiments with reference to the accompanying drawings, in which:

[0049] **FIG. 1** is a diagram illustrating a general RCPC or RCPT code;

[0050] **FIG. 2** is a diagram showing a general W-CDMA network;

[0051] **FIG. 3** is a diagram showing a general UTRAN;

[0052] **FIG. 4** is a diagram showing protocol stacks in UTRAN;

[0053] **FIG. 5A** is a diagram showing a UTRAN when RNC has both of SRNC and CRNC function in accordance with the present invention;

[0054] **FIG. 5B** is a diagram showing UTRAN when RNC has CRNC function and other RNC has SRNC function in accordance with the present invention;

[0055] **FIG. 6** is a diagram showing relations among conventional RLC-PU, RLC-PDU, MAC-PDU and transport block;

[0056] **FIG. 7** is a diagram showing a data process method of a transmitting part in accordance with the present invention;

[0057] **FIG. 8** is a diagram showing a data processing method of a receiver in accordance with the present invention;

[0058] **FIG. 9** is a flowchart showing a data processing method in accordance with the present invention; and

[0059] **FIG. 10** is a flow chart showing a data transmission method in case of using a relation indicator in accordance with the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0060] Hereinafter, a data processing method for hybrid ARQ type II/III downlink of a wide-band radio communication system according to the present invention will be described in detail referring to the accompanying drawings.

[0061] Referring to **FIG. 5**, an asynchronous mobile communication system having an interlocking structure is described. Under the interlocking structure, a UMS terrestrial radio access network (UTRAN) **200** may have one or more radio network controller (RNC). The RNC can perform a serving radio network controller (SRNC) function, a controlling radio network controller (CRNC) function or both functions.